

Application No.: 10/044,258
Amendment Dated: May 31, 2005
Reply to Office Action of: March 24, 2005

MTS-082US1

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1.-8. (Cancelled).

9. (Previously Presented) A method for driving a solid state image pickup device having a plurality of unit pixel means where each one of the plurality of unit pixel means corresponds to a pixel means having at least one input converting section, and CCD electric charge transfer means, the method comprising the steps of:

setting only a single first signal charging period and only a single second signal charging period for each one of the plurality of unit pixel means, where the single second signal charging period occurs after the single first signal charging period and is shorter than the single first signal charging period;

setting the single first signal charging period of a first unit pixel means and the single first charging period of a second unit pixel means so that the single first signal charging periods for the first and second unit pixel means have coinciding start times, the first and second unit pixel means are adjacent to each other in a vertical direction;

setting the single second signal charging period of the first unit pixel means and the single second signal charging period of the second unit pixel means so that the single second signal charging periods for the first and second unit pixel means have different start times and similar time duration during which a second signal charge is produced within each unit pixel means; and

Application No.: 10/044,258
Amendment Dated: May 31, 2005
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MTS-082US1

adding the second signal charge of the first unit pixel means to the second signal charge of the second unit pixel means for output by the CCD electric charge transfer means.

10. (Previously Presented) The method for driving a solid state image pickup device according to claim 9 wherein the second signal charging period is controlled using an electronic shuttering operation.

11. (Previously Presented) A method for driving a solid state image pickup device having a plurality of unit pixel means where each one of the plurality of unit pixel means corresponds to a pixel means having at least one input converting section, and CCD electric charge transfer means, the method comprising the steps of:

setting only a single first signal charging period and only a single second signal charging period for each one of the plurality of unit pixel means, where the single second signal charging period occurs after the single first signal charging period and is shorter than the single first signal charging period;

setting the single second signal charging period of a first unit pixel means and the single second signal charging period of a second unit pixel means so that the single second signal charging periods for the first and second unit pixel means have different start times and similar time duration during which a second signal charge is produced within each unit pixel means, the first and second unit pixel means are adjacent to each other in a vertical direction; and

adding the second signal charge of the first unit pixel means to the second signal charge of the second unit pixel means for output by the CCD electric charge transfer means

12. (Previously Presented) The method for driving a solid state image pickup device according to claim 11, wherein the second signal charging period is controlled using an electronic shuttering operation.

Application No.: 10/044,258
Amendment Dated: May 31, 2005
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MTS-082US1

13. (Previously Presented) A solid state image pickup device comprising:

a plurality of unit pixel means arranged in a two dimensional matrix with a horizontal axis and a vertical axis where each one of said plurality of unit pixel means corresponds to one pixel in an image, each one of said plurality of unit pixel means comprising:

- (1) at least one input converting section,
- (2) CCD electric charge transfer means, and
- (3) four transfer electrodes;

wherein eight transfer electrodes are provided for two unit pixel means adjacent to each other in a vertical direction;

pulse generating means for driving the eight transfer electrodes;

means for setting a first signal charging period and a second signal charging period for each one of the plurality of unit pixel means, where the second signal charging period occurs after the first signal charging period and is shorter than the first signal charging period;

means for setting the second signal charging period for the two unit pixel means which are adjacent to each other in the vertical direction so that the second signal charging period for each of the two unit pixel means have different start times and similar time durations; and

means for adding signal charges of the two unit pixel means from the second charging periods.

14. (Previously Presented) A method for driving a solid state image pickup device, the method comprising the steps of:

Application No.: 10/044,258
Amendment Dated: May 31, 2005
Reply to Office Action of: March 24, 2005

MTS-082US1

(a) setting a first signal charging period and a second signal charging period for each one of a plurality of unit pixel means, the plurality of unit pixel means being arranged in a matrix with horizontal rows, where the second signal charging period is shorter than the first signal charging period and a first signal charge is produced during the first signal charging period and a second signal charge is produced during the second signal charging period;

wherein the second signal charges of pairs of unit pixel means which are vertically adjacent are added;

(b) enlarging the second signal charge.

15. (Previously Presented) The method for driving a solid state image pickup device according to claim 14, wherein when an electric charge is transferred using a vertical CCD electric charge transfer means having four electrodes provided for one unit pixel, the first signal charge obtained during the first signal charging period and the second signal charge obtained during the second signal charging period are transferred existing together in said vertical CCD electric charge transfer means.

16. (Cancelled).

17. (Previously Presented) The method for driving a solid state image pickup device according to claim 14, wherein the second signal charge step (b) is enlarged in proportion to a ratio of the first signal charging period to the second signal charging period.

18. (Previously Presented) The method for driving a solid state image pickup device according to claim 14, wherein step (b) includes the step of judging whether the first signal charge is saturated or not saturated.